

Application No. 10/036,666
Amendment in response to May 7, 2004, Action

Attorney's Docket No. 0119-064

LISTING OF CLAIMS

This Listing of Claims replaces all prior versions and listings of the claims in this application.

13. (currently amended) A proximity detector for use in a mobile telephone having at least a microphone and a loudspeaker operatively connected to signal processing means, the proximity detector comprising:

data processing and control means including means for controlling the signal processing means for activating the loudspeaker to reproduce an acoustic control signal;

correlating means for correlating a control signal received directly by the microphone and a control signal reflected from a user of the telephone and then received by the microphone for determining a distance between the telephone and the user based on a known direct distance between the microphone and the loudspeaker, wherein a difference between a time of receipt of the directly received control signal and a time of receipt of the reflected control signal corresponds to the determined distance between the telephone and the user; and

signal level control means for controlling the signal processing means for varying the signal level of an audible signal reproduced by the loudspeaker proportionally to the determined distance.

14. (previously added) The proximity detector according to claim 13, wherein the data processing and control means include:

attenuation determining means for determining the attenuation of the control signal received directly by the microphone; and

means for varying the signal level of an audible signal reproduced by the loudspeaker inversely proportionally to the attenuation.

15. (previously added) The proximity detector according to claim 13, wherein the correlating means include means for comparing the signal level of the directly received control signal with the signal level of the reflected control signal for determining the distance between the telephone and the user.

16. (previously added) The proximity detector according to claim 13, wherein the correlating means include means for comparing a signal delay of the directly

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received control signal with a signal delay of the reflected control signal for determining the distance between the telephone and the user.

17. (previously added) The proximity detector according to claim 13, wherein the control signal is an ultrasonic signal.

18. (previously added) The proximity detector according to claim 13, wherein the control signal is an audible signal.

19. (previously added) The proximity detector according to claim 13, wherein the control signal is a ring or a voice signal.

20. (currently amended) A proximity detector for use in a mobile telephone having at least a microphone and a loudspeaker operatively connected to signal processing means, the proximity detector comprising:

data processing and control means including means for controlling the signal processing means for activating the loudspeaker to reproduce an acoustic control signal;

correlating means for correlating a control signal received directly by the microphone and a control signal reflected from a user of the telephone and then received by the microphone for determining a distance between the telephone and the user based on a known direct distance between the microphone and the loudspeaker, wherein a difference between a time of receipt of the directly received control signal and a time of receipt of the reflected control signal corresponds to the determined distance between the telephone and the user;

~~attenuation-determining~~ means for determining the attenuation of a the control signal received directly by the microphone; and

means for varying the signal level of an audible signal reproduced by the loudspeaker inversely proportionally to the attenuation.

21. (currently amended) A mobile telephone apparatus, comprising:
a microphone;
a loudspeaker;
signal processing means operatively coupled to the loudspeaker; and
a proximity detector including

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data processing and control means including means for controlling the signal processing means for activating the loudspeaker to reproduce an acoustic control signal;

correlating means for correlating a control signal received directly by the microphone and the control signal reflected from a user of the telephone and then received by the microphone for determining a distance between the telephone and the user based on a known direct distance between the microphone and the loudspeaker, wherein a difference between a time of receipt of the directly received control signal and a time of receipt of the reflected control signal corresponds to the determined distance between the telephone and the user; and

signal level control means for controlling the signal processing means for varying the signal level of an audible signal reproduced by the loudspeaker proportionally to the determined distance.

22. (currently amended) A method for sound-based proximity detection in a mobile telephone having at least a microphone and a loudspeaker operatively connected to signal processing means, the method comprising the steps of:

controlling the signal-processing means to activate the loudspeaker to reproduce an acoustic control signal;

receiving first and second control signals from the microphone corresponding to an acoustic control signal received directly from the loudspeaker and an acoustic control signal reflected from a user of the telephone and then received, respectively;

correlating the first and second control signals to determine the distance between the telephone and the user based on a known direct distance between the microphone and the loudspeaker, wherein a difference between a time of receipt of the directly received control signal and a time of receipt of the reflected control signal corresponds to the determined distance between the telephone and the user; and

generating a data control signal for the signal processing means to activate the loudspeaker for reproducing audible signals having a signal level that is proportional to the determined distance between the telephone and the user.

23. (previously amended) The method according to claim 22, further comprising the steps of:

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determining the attenuation of the control signal received directly from the loudspeaker; and

varying the signal level of an audible signal reproduced by the loudspeaker inversely proportionally to the attenuation.

24. (currently amended) A method for sound-based proximity detection in a mobile telephone having at least a microphone and a loudspeaker operatively connected to signal processing means, the method comprising the steps of:

controlling the signal processing means to activate the loudspeaker to reproduce an acoustic control signal;

correlating first and second acoustic control signals to determine the distance between the telephone and a user based on a known direct distance between the microphone and the loudspeaker, wherein a difference between a time of receipt of the first acoustic control signal that is directly received and a time of receipt of the second acoustic control signal that is reflected from the user corresponds to the determined distance between the telephone and the user;

determining the attenuation of a the first acoustic control signal transmitted directly to the microphone from the loudspeaker; and

controlling the signal processing means to vary the signal level of an audible signal reproduced by the loudspeaker inversely proportionally to the attenuation.